

1.0 INTRODUCTION

Fluor Daniel Hanford, Inc. (FDH) is the Management and Integration contractor for the U.S. Department of Energy (DOE), Richland Operations Office (RL) at the Hanford Site (Fig. 1). The activities, processes, and events described in this report involve personnel from the City of Richland, the Washington State Department of Health (WDOH), RL, FDH, and several subcontractors. Additional support was provided by the Washington State Department of Ecology and the U.S. Environmental Protection Agency.

The September 1998 radiological contamination spread that occurred at the Hanford Site primarily consisted of a single vector, fruit flies, spreading low levels of radioactive contamination from a suspected work site south of B Plant to numerous locations within and around the 200 East Area (Fig. 2), located on the central plateau, about 13 kilometers (8 miles) south of the Columbia River and 40 kilometers (25 miles) north of Richland, Washington. The incident occurred near a construction yard adjacent to B Plant (Fig. 3), which is a deactivated processing facility.

As a result of a small amount of contamination being spread outside the contamination areas, some radioactive contamination inadvertently was sent to the City of Richland Landfill on refuse from the Hanford Site. On September 30, shipments of Hanford Site solid-waste refuse to the City landfill were stopped, the City of Richland and the WDOH were notified of a suspected contaminated shipment, and immediate survey actions were planned and initiated. Contaminated Hanford Site refuse was found by October 12, 1998, and the last container was removed from the City landfill by October 14, 1998. Approximately 191,000 kilograms (210 tons) of refuse were returned to the Hanford Site, of which an estimated 23 kilograms (50 pounds) were contaminated. The estimate is based on the number of bags of refuse (11).

This report is structured as follows:

- Chapter 1 introduces the event and the scope, purpose, and methodology of the investigation.
- Chapter 2 summarizes the Hanford Site facilities and programs involved in the event. A more complete description is provided in Appendix H.
- Chapter 3 presents a detailed chronology of activities, which also are summarized on the overall timeline in Exhibit A.
- Chapter 4 is a synopsis of the causal analysis study that determined the root cause, the direct cause, and the contributing causes of the incident. A more detailed version of the report is provided in Appendix D.

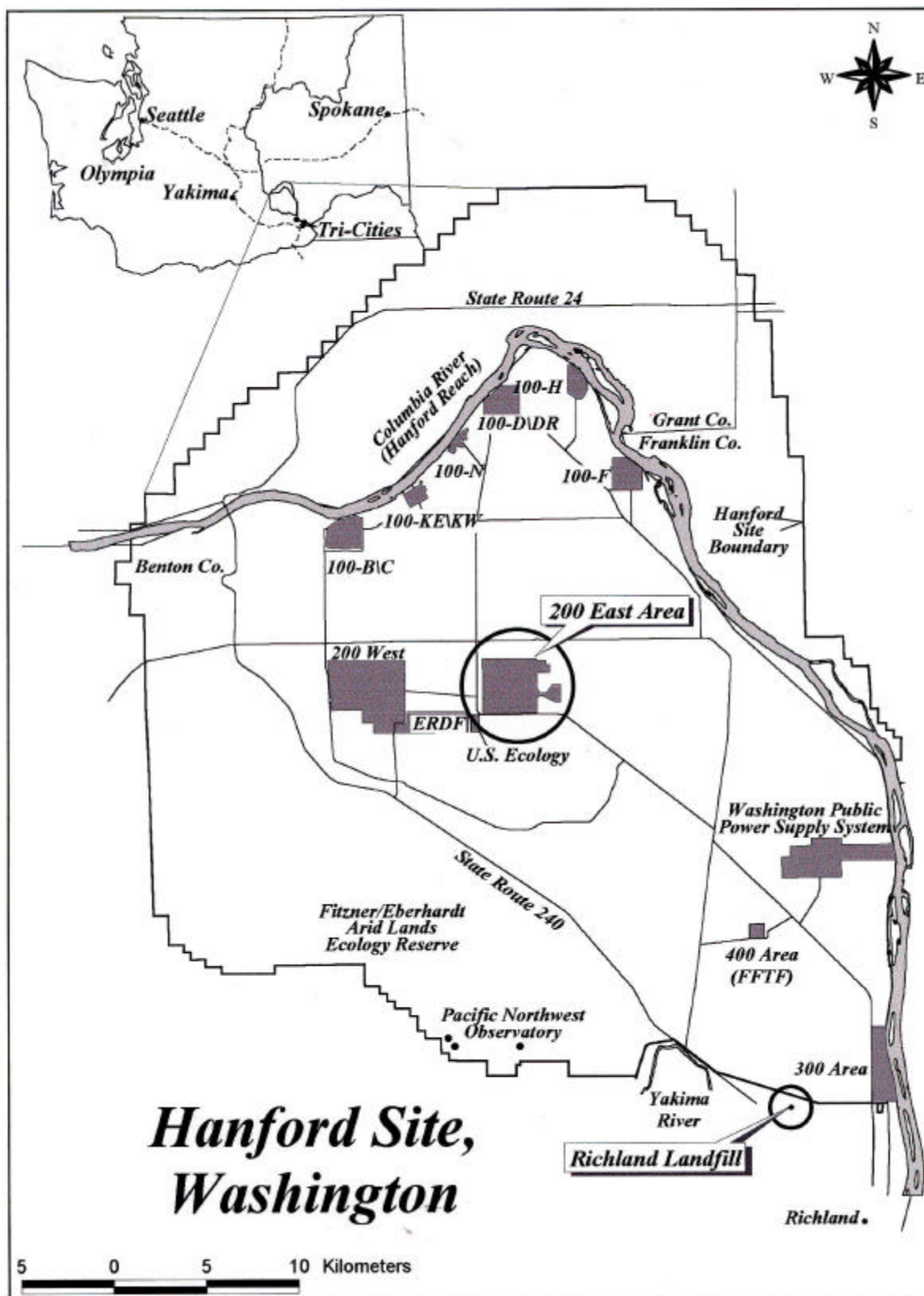
Figure 1. Hanford Site, Washington.

Figure 2. 200 East Area, Hanford Site.

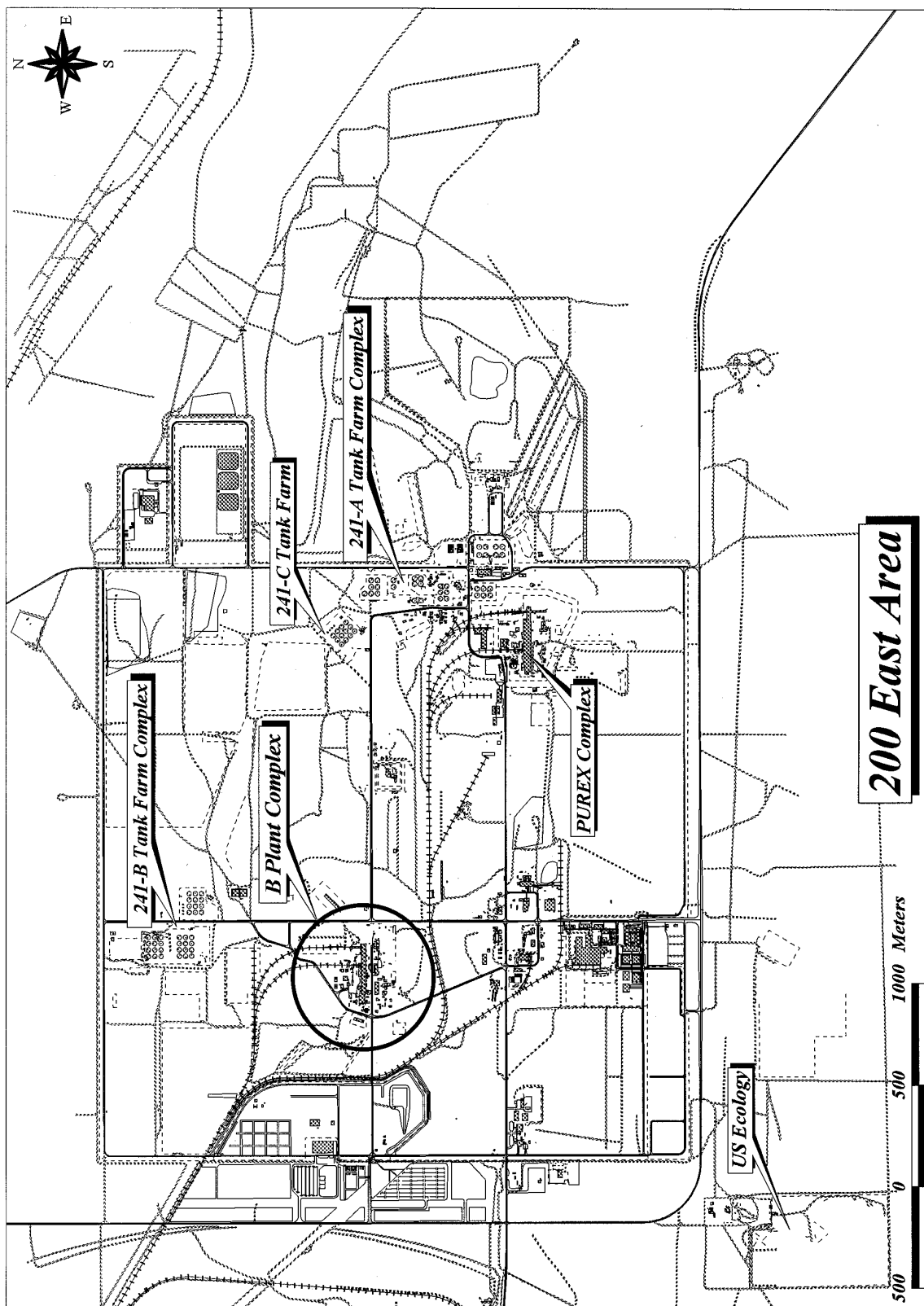
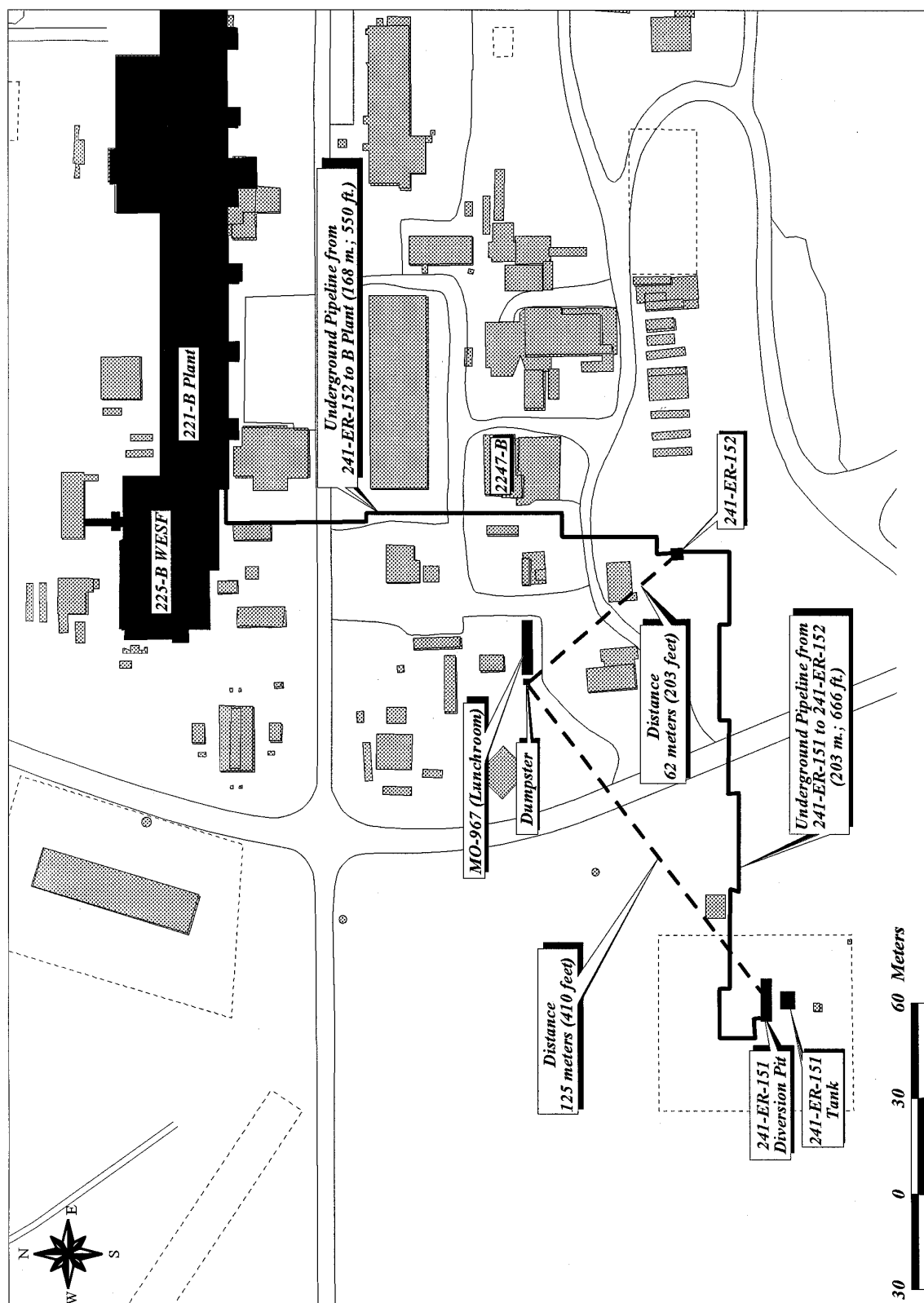


Figure 3. Relationship of Facilities Near B Plant.

- Chapter 5 describes issues that arose during the event and during the response to the event, and provides judgments of need so that if another such event occurs, the response will be even more effective. It also explains the new refuse disposal processes developed for the Hanford Site.
- Chapter 6 summarizes the report conclusions and the lessons learned during the event and provides recommended actions geared to specific judgments of need.

1.1 SCOPE OF THE REPORT

This report identifies the factors and activities leading up to the fall 1998 200 East Area radiological contamination; details the actions taken and facts assembled as the location of the contamination was discovered; *documents the paramount concerns and steps taken to protect the health and safety of the Site workers, the public, and the environment*; chronicles the contamination cleanup and return to normal activities and refuse collection and disposal; and identifies measures taken or planned to preclude any further such incidents.

1.2 INVESTIGATION SCOPE, PURPOSE, AND METHODOLOGY

The scope, purpose, and methodology of the investigation developed as the investigation and remedial actions proceeded. As new issues arose, they were incorporated into the investigation and response.

1.2.1 Scope

The scope of the investigation was to analyze, remediate, investigate, and review the spread of contamination at the Hanford Site and, eventually, the City landfill and to determine its root and contributing causes. During the incident, the team identified the suspected contamination source and pathways, mitigated the spread of contamination, implemented decontamination and returned areas to normal conditions, and devised ways to prevent recurrence.

1.2.2 Purpose

The purposes of the investigation were as follows.

- Determine the cause of the incident.
- Identify and control the contamination source.
- Prevent recurrence.

- Assist in improving Hanford Site policies, procedures, and practices to avoid future incidents.
- Establish a clear path forward to close out activities at the City landfill.
- Regain the confidence of the City of Richland and the public so that resumption of hauling to the City landfill could be allowed.
- Identify and understand the lessons learned to improve safety and reduce the potential for similar incidents at the Site and across the DOE complex.
- Resume Hanford Site refuse disposal operations.
- Improve capabilities to respond to similar incidents.
- Keep employees, the community, and other interested parties informed.

1.2.3 Methodology

The teams responded to the event by conducting an investigation and proceeding with remediation using a methodology consisting of the following actions.

- Identify potential source terms and transport mechanisms. (See Appendix B, Section B2.0, for discussion on source terms and transport mechanisms.)
- Implement and evaluate random and specific radiological sampling for contaminated fruit flies and other vectors in the 200 Areas.
- Interview the personnel who use the MO-967 Mobile Office and the surrounding area.
- Identify personnel and equipment associated with contamination spread.
- Survey possessions, vehicles (e.g., examine the exteriors of vehicles parked near B Plant and those of vendors and offsite² contractors that might have come in contact with contaminated material or vectors), offices, and homes of potentially affected personnel for contamination.
- Conduct bioassay analysis of all potentially affected individuals.
- Determine the location of past uses of glycerin/monosaccharide (simple sugar)-based fixatives.
- Establish a 2.5 hectare (6.2-acre) radiological buffer area (RBA) south of B Plant.

² Off Site and offsite refer to locations outside the boundaries of the Hanford Site. On Site and onsite refer to locations within the Hanford Site boundaries.

- Trap flying insects at multiple locations around the Hanford Site, both inside and outside the RBA.
- Survey all Hanford Site dumpsters for contamination.
- Plot maps of the Hanford Site and the City landfill to track the locations of contamination.
- Survey the City landfill cells known to contain Hanford Site refuse.
- Trace the movement of all potentially contaminated refuse, equipment, and material from its point of origin to its current location.
- Plan and implement recovery operations at the Hanford Site and the City landfill.
- Minimize refuse generation at the Hanford Site during the incident.

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